

Exploiting *Trichoderma*: From food security to biotechnology

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From improving food security to their use as biotechnology power horses, *Trichoderma* fungi are increasingly being exploited by industry. Current advances in the field are brought together and highlighted in a special issue of *Microbiology* published online on 27 December.

Trichoderma are free-living fungi widely used in [agricultural biotechnology](#). Some species of *Trichoderma* are specifically used as [biocontrol agents](#) to control [plant pathogens](#) including *Fusarium* species. Their success is partly due to mycoparasitism – a lifestyle where one fungus is parasitic on another fungus. Regular use of *Trichoderma* species on plants can reduce the need to use chemical pesticides. This provides an economic advantage to farmers and helps improve food security.

Trichoderma are naturally found in the soil where they form symbiotic associations with plants. The microbe–plant relationship can alter plant gene expression to confer a range of benefits to the plant, including increased resistance to pathogens and abiotic stresses, such as drought and heat. The efficiency of photosynthesis and nitrogen fertilizer uptake can also be improved through altered gene expression. Typically, these genetic changes lead to a net increase in plant growth and productivity.

One member of the genus, *Trichoderma reesei*, is used as a biotechnological cell factory for the large-scale production of cellulase enzymes (needed for biofuel production) and recombinant proteins. *T. reesei* is also a widely-used model for studying protein secretion.

Benjamin A. Horwitz (Technion, Israel) and Alfredo Herrera-Estrella (National Laboratory of Genomics for Biodiversity, Mexico), who compiled the issue, hope the collection of papers will be a useful tool for researchers. "This special issue brings together recent work from the *Trichoderma* research community and a collection of reviews that will hopefully stimulate new work on this fascinating group of fungi," they said. "We hope that this will allow the identification of new opportunities for the exploitation of this microbe's impressive genetic potential."

Provided by Society for General Microbiology

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